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(54) Dispensing arrangement from a bag

(57) A dispenser for doses of a viscous fluid such as liquid soap comprises a bag 40 with an outlet at the bottom, and an insert member 50 inside the bag and fixed in the outlet, the insert member comprising a lower region 51 with an outlet 52, and an upper region 53 which is arranged to be squeezed through the bag walls for dispensing a dose and which restores itself after squeezing to substantially its uncompressed state and moves apart the bag walls. The outlet 52 of the insert member may have narrow slits serving as a valve, or alternatively the lower region 51 may comprise an internal slit diaphragm (57, Fig. 9 not shown). The bag 40 may be housed within a holding unit 60 incorporating means for squeezing the bag. The lower region 51 may be relatively rigid.

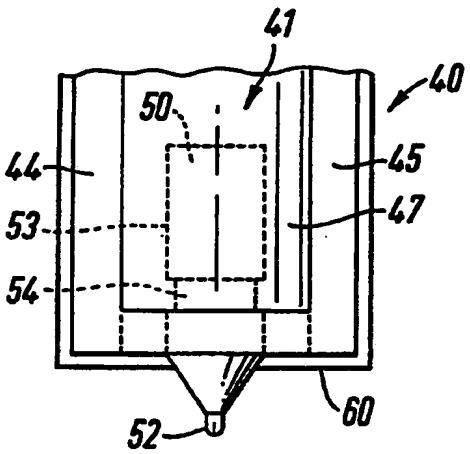

Fig. 4

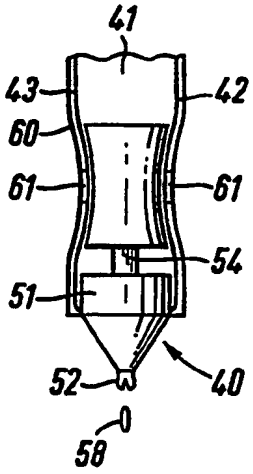

Fig. 7

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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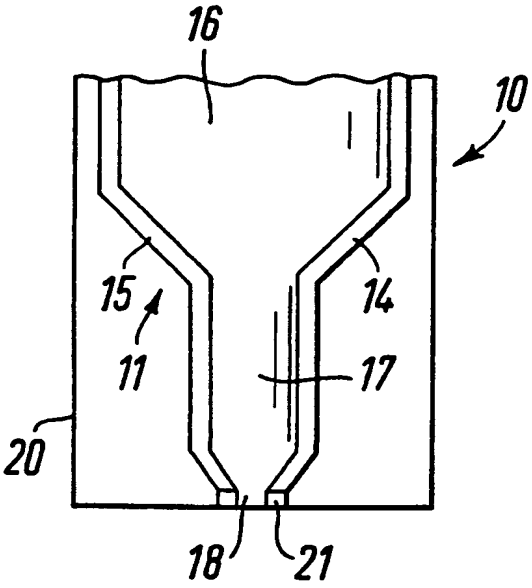

Fig. 1

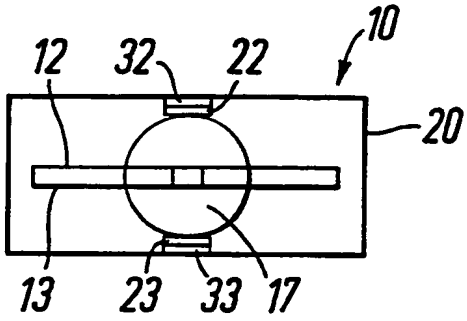

Fig. 2

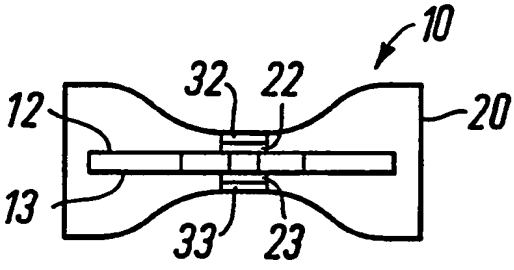

Fig. 3

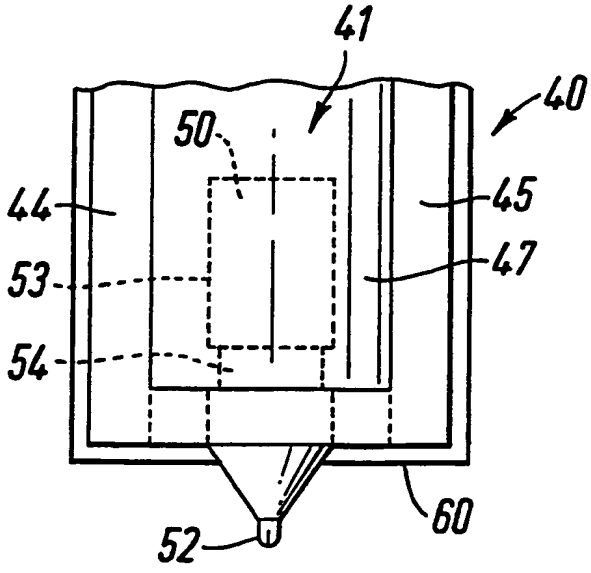

Fig. 4

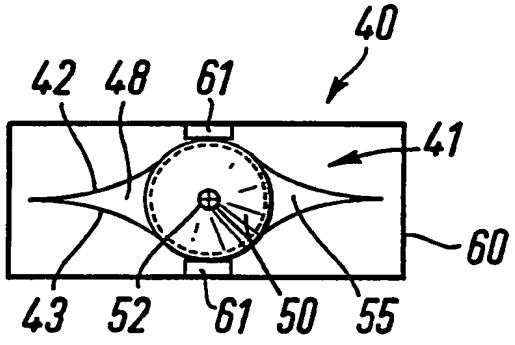

Fig. 5

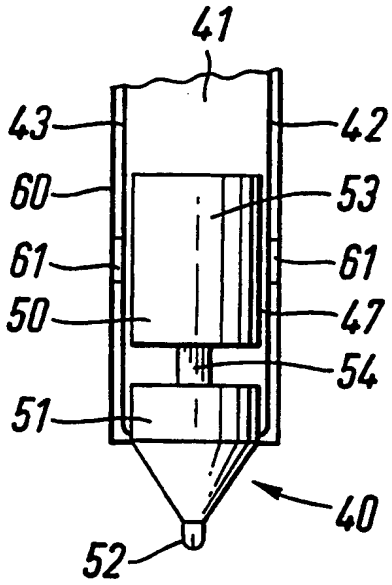

Fig. 6

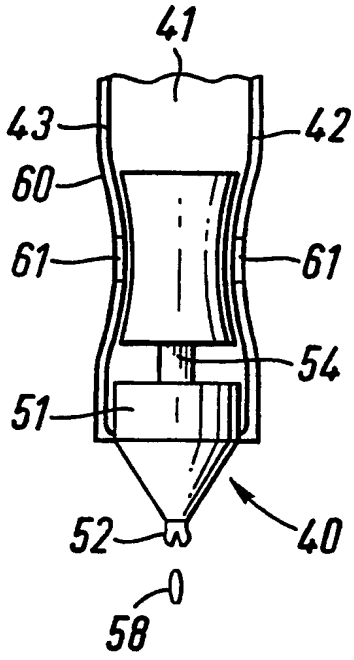

Fig. 7

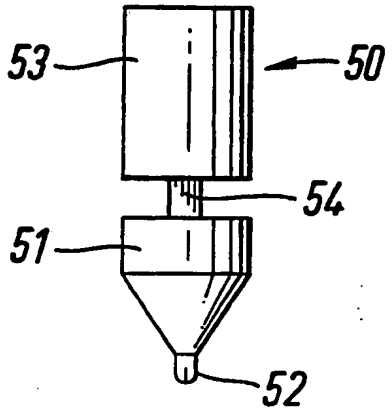

Fig. 8

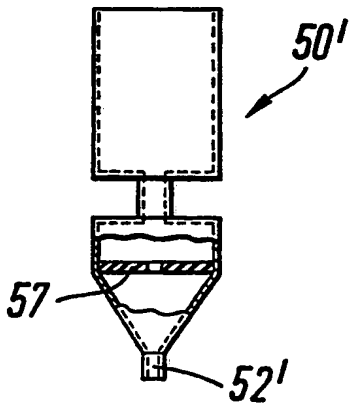

Fig. 9

Dispensing Arrangement

The present invention relates to an arrangement for dispensing doses of a viscous fluid such as liquid soap, sauce or adhesive.

There is known to the Applicant a dispensing arrangement comprising a plastic bag formed from two sheets of plastics material heat-welded together to define a pumping chamber with an outlet at one end. Fluid is dispensed by squeezing the bag in the region of the chamber which forces fluid out of the outlet. Such an arrangement has a number of problems. Firstly, fluids with a high viscosity can be difficult to dispense repeatedly, whereas fluids with a low viscosity tend to drip. Secondly, after the bag has been squeezed, its return to its original shape can be slow and unreliable which means that the pumping chamber is not ready to dispense the next dose.

The present invention seeks to overcome or reduce one or more of the above problems.

According to the present invention there is provided a dispensing arrangement comprising a bag with flexible walls with an outlet opening at one end, and an insert member located within the bag adjacent the outlet opening and arranged to be compressed through the bag walls, the material of at least part of the insert member being such as to restore itself after compression to substantially its uncompressed state, whereby to move apart the walls of the bag.

The insert member preferably comprises a first region

located at the outlet opening of the bag and a second region spaced upstream of the first region which is arranged to be compressed through the bag walls, wherein it is the material of the second region which is such as to restore itself after compression.

The first and second region of the insert member are preferably interconnected by an intermediate region which isolates the first region from the compressions and expansions of the second region.

Preferred embodiments of the present invention will now be described, by way of example only, with reference the accompanying drawings, of which:

Fig. 1 is a front view of the bottom end of a prior art fluid dispenser;

Fig. 2 and 3 are bottom end views of the prior art dispenser of Fig. 1 in expanded and compressed conditions respectively;

Fig. 4 is a front view of the bottom end of a fluid dispenser in accordance with a first embodiment of the present invention;

Fig. 5 is a bottom end view of the dispenser of Fig. 4;

Fig. 6 and 7 are side views of the dispenser of Fig. 4 in expanded and compressed conditions;

Fig. 8 is a side view of the insert member of the dispenser of Fig. 4; and

Fig. 9 is a view similar to Fig. 8 of a modified insert

member.

Referring to the drawings, Figures 1 to 3 show a prior art dispenser 10 comprising a bag 11 formed of two layers 12,13 of flexible plastics film material, heat-welded together along areas 14 and 15 to define a fluid reservoir 16, and a pumping chamber or section 17 while leaving an outlet opening or valve 18. Each layer 12,13 is made by co-extruding two different materials, such as polyethylene and polypropylene, so that one material is on one face of the finished sheet and the other on the opposite face. When heat welding the layers 12,13 to each other, the material with the lower melting point is arranged to be on the inner faces, so that the outer surfaces do not adhere to the welding tool. The bag is housed in a holding unit 20.

As described so far the dispenser operates as follows. With pumping chamber 17 full of fluid, Fig. 2, it is squeezed to expel a dose of fluid from outlet opening 18. The dispenser now has the shape shown in Fig. 3. Over a period of time, fluid from reservoir 16 moves under the force of gravity downwards into pumping chamber 17 thereby expanding it back to its shape shown in Fig. 2. Such a process is slow, unpredictable and unreliable. Also, low viscosity fluids have a tendency to drip from the outlet opening 18, necessitating the use of foam rubber pads 21 attached to the holding unit 20 to hold closed the mouth of the outlet.

Another problem is that high viscosity fluids do not flow sufficiently well into the pumping chamber 17, necessitating some way of rapidly drawing apart the opposing walls 12, 13 of the pumping chamber. One way of doing this is to attach patches of hooked "touch and close" material at locations 22 and 23 and matching

patches 32, 33 on adjacent parts of the holding unit 20. With the facing patches engaged, a movable spring section of the unit 20 moves the two halves of the pumping chamber 17 both in and out so as to produce compression and expansion thereof. Such an arrangement is difficult to assemble and is unreliable in practice.

A dispenser in accordance with the present invention which seeks to overcome these disadvantages will now be described with reference to Figures 4 to 8. A dispenser 40 comprises a bag 41 formed in similar fashion to bag 11 of two layers 42, 43 of flexible plastics film material, heat-welded together at areas 44 and 45 to define a reservoir (not shown) corresponding to reservoir 16 and a pumping chamber 47 while leaving a relatively large outlet opening 48.

The dispenser 40 further comprises a moulded insert 50, preferably of a plastics material such as polyethylene. The insert comprises a bottom region 51, which is of general funnel shape with a narrow outlet tube 52, and a generally-cylindrical top region 53 arranged to be located in the pumping chamber 47 of the bag 41. The end of tube 52 is provided with narrow slits so that it serves as an outlet valve. Region 53 and the top of region 51 have the same circular cross-section and are interconnected by means of a narrow channel through a cross-member 54.

The top of region 51 is heat-welded to the inside edges of layers 42, 43 adjacent to opening 48. To achieve a fluid-tight arrangement, the sides at the top of region 51 are provided with shaped wings 55 to avoid tight bends in the welds.

Dispenser 40 is housed in a holding unit 60 which has a

mechanism (indicated schematically by numeral 61) which is activated by a button or handle etc. for squeezing or crushing the pumping chamber 47 and the region 53 therein.

In use, region 53 can be easily crushed by activating the mechanism 61 etc. to enable a dose of fluid 58 to pass through region 51 to outlet 57; after being crushed, the material of region 53 is such that it quickly expands again to its original size, thus opening up the pumping chamber 47 to create a pressure drop and to draw more fluid from the reservoir 46. However, the presence of cross-member 54 ensures that the cross-sectional shape of region 51 remains substantially unaltered throughout the whole of this process.

The just-described dispenser has a number of advantages. In particular the walls of the pumping chamber 47 are immediately expanded again by region 53 after a dose of fluid has been expelled. Because region 53 returns to its original size and shape automatically, the mechanism 61 etc. need only operate inwardly, unlike the prior art arrangement which was required to operate the walls of dispenser 10 both inwardly and outwardly. Moreover, since regions 51 and 53 of the insert 50 are effectively isolated by intermediate region 54, repeated compression and expansion movements of section 53 do not affect the operations of the outlet value.

Numerous modifications may be made to the above-described embodiments. The various heat welds may be replaced by suitable adhesive, if desired. Since it is the bag walls at the pumping chamber 47 which produce movement of the fluid, region 53 of the insert does not need to be solid and may be in the form of a cage, or just legs providing they are capable of moving the bag

walls apart again after dispensing a dose. The walls 42, 43 of the bag 41 may extend over the outlet tube 52 if desired.

In modifications, regions 51 and 53 may be isolated in other ways, e.g. by an intermediate region of more rigid material and/or by making region 51 itself of more rigid material. An insert in which there is no isolation between the two regions will also work.

Indeed it is possible to omit region 51 altogether which would be equivalent to securing a shorter insert to the pumping chamber region 17 of the prior art bag 10. This, however, would not be so advantageous since it would necessitate securing the insert to the bag at this region; a heat-weld here would have a relatively short expected lifetime. A feature of the dispenser 40 is that the heat-welded region is spaced from the region subjected to compression movements.

Fig. 9 shows an insert 50′ with a modified outlet valve in which the end of tube 52′ is open, but a slit rubber diaphragm 51 is incorporated into the moulding to serve as a valving mechanism.

Claims

1. A dispensing arrangement comprising a bag with flexible walls with an outlet opening at one end, and an insert member located within the bag adjacent the outlet opening and arranged to be compressed through the bag walls, the material of at least part of the insert member being such as to restore itself after compression to substantially its uncompressed state, whereby to move apart the walls of the bag.

2. An arrangement according to Claim 1, wherein the insert member comprises a first region located at the outlet opening of the bag and a second region spaced upstream of the first region which is arranged to be compressed through the bag walls, wherein it is the material of the second region which is such as to restore itself after compression.

3. An arrangement according to Claim 2, wherein the first and second regions of the insert member are preferably interconnected by an intermediate region which isolates the first region from the compressions and expansions of the second region.

4. An arrangement according to Claim 2 or 3, wherein the first region is of funnel shape and the second region is of generally cylindrical shape and is interconnected to the first region by means of a narrow channel through a cross-member.

5. An arrangement according to any of claims 2 to 4, wherein the first region of the insert member has an outlet tube with narrow slits.

6. An arrangement according to any of claims 2 to 4, wherein the first region of the insert member

incorporates an internal slit diaphragm.

7. An arrangement according to any preceding claim wherein the insert member has wing portions on the exterior thereof.

8. An arrangement according to any preceding Claim, wherein the bag is housed in a holding unit with means for squeezing the bag and the insert member.

9. A dispensing arrangement substantially as herein described with reference to Figs 4 to 8, or to Fig.9 of the accompanying drawings.

10. A method of dispensing a viscous fluid employing an arrangement according to any preceding claim.

Amendments to the claims have been filed as follows

1. A dispensing arrangement comprising a bag with flexible walls with an outlet opening at one end, and an insert member located within the bag adjacent the outlet opening and comprising a first region located adjacent the outlet opening of the bag and a second region spaced upstream of the first region which is arranged to be compressed through the bag walls, the material of the second region being such as to restore itself after compression to substantially its uncompressed state, whereby to move apart the walls of the bag, wherein the first and second regions of the insert member are interconnected by an intermediate region which isolates the first region from the compressions and expansions of the second region.

2. An arrangement according to claim 1, wherein the intermediate region has a substantially smaller cross-section than the first and second regions.

3. An arrangement according to claim 2, wherein the first region is of funnel shape and the second region is of generally cylindrical shape and is interconnected to the first region by means of a narrow channel through a cross-member.

4. An arrangement according to any of claims 1 to 3, wherein the first region of the insert member has an outlet tube with narrow slits.

5. An arrangement according to any of claims 1 to 3, wherein the first region of the insert member incorporates an internal slit diaphragm.

6. An arrangement according to any preceding claim, wherein the insert member has wing portions on the exterior thereof.

7. An arrangement according to any preceding claim, wherein the bag is housed in a holding unit with means for squeezing the bag and the insert member.

8. A dispensing arrangement substantially as herein described with reference to Figs 4 to 8, or to Fig.9 of the accompanying drawings.

9. A dispensing arrangement comprising a bag with flexible walls with an outlet opening at one end, and an insert member located within the bag adjacent the outlet opening and arranged to be compressed through the bag walls, the material of at least part of the insert member being such as to restore itself after compression to substantially its uncompressed state, whereby to move apart the walls of the bag, wherein the region of the insert member located adjacent to the outlet opening of the bag incorporates an internal slit diaphragm.

10. A dispensing arrangement comprising a bag with flexible walls with an outlet opening at one end, and an insert member located within the bag adjacent the outlet opening and arranged to be compressed through the bag walls, the material of at least part of the insert member being such as to restore itself after compression to substantially its uncompressed state, whereby to move apart the walls of the bag, wherein the insert member has wing portions on the exterior thereof.

(...ie Search report)

Relevant Technical Fields		Search Examiner M J RICHARDSON
(i) UK Cl (Ed.M)	B8K (KFB, KFC, KFD)	
(ii) Int Cl (Ed.5)	A47K 5/12, 5/122; B65D 30/24, 33/00, 35/28, 35/30, 35/40	Date of completion of Search 29 NOVEMBER 1994
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii) ONLINE DATABASES: WPI		Documents considered relevant following a search in respect of Claims :- 1-10

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E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	WO 93/05693 A1	(WILLIAMSON) see especially page 6	1,2,5,8,10
X	US 5242083	(CHRISTINE) see column 5 lines 35-44	1,2,5,8,10
X	US 4921136	(ROGGENBURG) see Figure 6	1,8,10
X	US 4634022	(O'HALLORAN) see Figure 7A	1,8,10

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